

November 13, 1952

Dr. S. Granick  
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New York 21, N.Y.

Dear Granick:

I will be happy enough to send you K-12-- but you can probably get it more quickly by phoning Bernie Davis across the street. The fact that it carries a symbiotic phage should be absolutely immaterial for your purposes.

On the other hand, I am rather doubtful that *E. coli* is well suited in its physiological behavior for your very interesting project. It never does oxidize very rapidly, and its cytochromes are just barely detectable by spectroscopy or the indophenol reaction. I do applaud your aim to use a sexual organism, but there are no other bacteria which are so far available from this viewpoint. I suspect that you will have to compromise in one of the following directions:

a) Use a bacterium amenable to the penicillin method. I think that *Pseudomonas fluorescens* is the best bet. It is a strict aerobe, is easily cultivated, and is quite amenable to penicillin selection. I have played with it just a bit-- Bernie, again, has the wild type strain I used (ask him for PF-15, which is the same as Stanier's A3.12) as well as some interesting auxotrophs I made a while ago. *Pseudomonas* is loaded with cytochromes. *Azotobacter* is even more heavily loaded (packed cells have a distinct red color), but it might be a little more difficult to handle. You could check with Perry Wilson here (or I will if you prefer) on some incidental genetic work that has been done on *Azotobacter*.

b) Use another organism, without the advantage of the penicillin method. In almost every respect, yeast is the obvious bug. There has already been a certain amount of work on cytochrome-deficient mutants, although not from the viewpoint of porphyrin synthesis. There is a great fund of genetic information generally, as well, of course, as an accumulated tradition on cytochrome, Pasteur effect, etc.

My own preference would be for b). Although penicillin presumably would not work, it may be feasible to find other agents with a comparable effect (I don't know of any work on this, penicillin or otherwise). In addition, the replica-plating method (J. Bact. March or April '52) makes the penicillin method less indispensable anyhow.

If I can provide any cultures, or help in any other way, please let me know. I will be most interested to hear how this turns out. I have had a speculative interest in the cytoplasmic control of respiratory metabolism for some time, but have never gone so far as to do anything about it. Sincerely